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EXAMINER	
SNELTING, ERIN LYNN	
ART UNIT	PAPER NUMBER
1791	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,092	ADIGRAT ET AL.	
	Examiner	Art Unit	
	Erin Snelting	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14,15 and 17-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14,15 and 17-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Acknowledgement is made of amendment received 12-16-2009. Claims 14, 19, 20, 24, and 28 are amended; claims 1-13 and 15 are cancelled.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 14, 15, and 17-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berkey '278 (US 2003/0024278 A1).

5. Regarding claims 14 and 17, Berkey '278 teaches:

a. producing a soot core preform by chemical deposition on a substrate ("The porous body may be formed…by depositing layers of soot onto a bait rod via an outside deposition ('OVD') process", paragraph [0081])

b. removing the substrate from the soot core preform, thereby forming a central hole along the soot preform ("mandrel 50 is removed from soot core blank 58. Upon removal of mandrel 50, soot core blank 58 defines an axially extending void or centerline aperture 60", paragraph [0082])

c. drying ("soot preform 5 is preferably chemically dried…within consolidation furnace 64", paragraph [0084]) and consolidating the soot core preform in a furnace to form a glass core preform ("the soot preform 58…can be consolidated into a glassy preform", paragraph [0087]; "Following the chemical drying step, the temperature of the furnace is elevated to a temperature sufficient to consolidate the soot into a consolidated preform", paragraph [0084])

d. stretching the glass core preform ("redrawing of the preform 10...drawing of the preform 100", paragraph [0112])

e. the step of drying and consolidating comprises reducing the diameter of the central hole without extracting the glass core preform from the furnace ("centerline aperture 60 is evacuated to reduce the pressure therein…sufficient to only partially close or contract the inside diameter of the preform 100 wherever the preform is at a first temperature sufficient to radially close the centerline aperture 60 thereat", paragraph [0093]; "the preform 100 may be a soot preform 58, or a preform 58 which comprises both consolidated glass and silica-based soot…the preform 100, or glassy preform 55, may have just been consolidated in the same furnace", paragraph [0104])

f. the step of stretching comprises closing the central hole ("The centerline aperture 60 is preferably fully closed...during, redrawing of the preform 10...or the drawing of the preform 100", paragraph [0112]).

Examiner notes that while Berkey '278 does not explicitly state that the glass core preform is not extracted from the furnace during drying, consolidating, and reducing the diameter of the central hole, it is considered implicit in the statement in paragraph [0104] that the preform "may have just been consolidated in the same furnace", as noted above. Alternatively, it is considered that it would have been obvious to one of ordinary skill in the art at the time of the invention to try processing the glass core preform without extracting the preform from the furnace, as claimed, as it is one of only two options, namely with extracting the preform or without extracting the preform, for the benefit of maintaining continuous processing and maintaining the temperature profile of the preform, thereby optimizing energy input to the system.

Berkey '278 is silent regarding the diameter of the central hole at the end of the drying and consolidating step. However, Berkey '278 teaches that the diameter of the central hole may be progressively reduced before final collapse (paragraph [0030]) and further discloses said diameter as a result effective variable because it may be altered in order to optimize the manner in which the central hole finally collapses, such that a smaller diameter increases surface tension effects and reduces the level of vacuum required for collapse (paragraphs [0114]-[0115], and also to optimize circularity and/or symmetry of the central hole, thereby reducing geometric perturbations in and improving performance of the final optical product (paragraphs [0116], [0119]). It has been held

that discovering an optimum value of a result effective variable involves only routine skill in the art. Please see In re Boesch, 617 F.2d 272, 205 USPQ (CCPA 1980). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Berkey '278 by optimizing the diameter of the central hole at the end of the drying and consolidating step for the benefit of optimizing the manner in which the central hole finally collapses and optimizing circularity and/or symmetry of the central hole, thereby reducing geometric perturbations in and improving performance of the final optical product.

6. Regarding claim 15, Berkey '278 further teaches the step of reducing the diameter of the central hole comprises:

a. reducing the pressure inside the central hole ("The pressure in the centerline aperture 60 is reduced…sufficient to only partially close ore contract the inside diameter of the preform 100…", paragraph [0093])

b. subjecting the glass core preform to a temperature sufficient to soften glass ("…wherever the preform is at a first temperature sufficient to radially close the centerline aperture 60 thereat", paragraph [0093]; "the temperature of that part of the perform is sufficiently high wherein that part of the preform is soft enough to enable the centerline aperture 60 in that region to contract", paragraph [0099]).

7. Regarding claim 18, Berkey '278 is silent regarding a specific ratio of the diameter of the central hole at the end of the drying and consolidating step to an initial diameter of the central hole. However, Berkey '278 teaches reducing the diameter of

the central hole from an initial diameter to a diameter at the end the drying and consolidating step (paragraph [0093]), such that the ratio of the end diameter to the initial diameter is 1 : >1. Berkey '278 further discloses the diameter of the central hole at the end of the drying and consolidating step as a result effective variable because it may be altered in order to optimize the manner in which the central hole finally collapses, such that a smaller diameter increases surface tension effects and reduces the level of vacuum required for collapse (paragraphs [0114]-[0115], and also to optimize circularity and/or symmetry of the central hole, thereby reducing geometric perturbations in and improving performance of the final optical product (paragraphs [0116], [0119]). Please see In re Boesch, 617 F.2d 272, 205 USPQ (CCPA 1980). It has also been held that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Berkey '278 by optimizing the ratio of the diameter of the central hole at the end of the drying and consolidating step to an initial diameter of the central hole for the benefit of optimizing the manner in which the central hole finally collapses and optimizing circularity and/or symmetry of the central hole, thereby reducing geometric perturbations in and improving performance of the final optical product.

8. Regarding claim 19, Berkey '278 further teaches the step of drying and consolidating includes:

a. drying the soot core preform at a first temperature ("Following the chemical drying step, the temperature of the furnace is elevated to a temperature sufficient to consolidate the soot into a consolidated perform", paragraph [0084])

b. consolidating the de-hydrated soot core preform at a second temperature higher than the first temperature ("Following the chemical drying step, the temperature of the furnace is elevated to a temperature sufficient to consolidate the soot into a consolidated perform", paragraph [0084]; "Typically, consolidation temperatures…lie in the range of 1400°C. to 1600°C", paragraph [0086])

c. subjecting the consolidated perform to a third temperature higher than the second temperature for reducing said diameter ("heating the perform…to a temperature between 1900°C. and…2100°C…wherein the centerline aperture…fully collapses upon itself", paragraph [0132] – Examiner notes that collapsing the aperture constitutes reducing the diameter of the central hole).

9. Regarding claim 20, Berkey '278 teaches drying and consolidating the soot core preform and reducing the diameter of the central hole to a desired value as described for claim 14 above. Berkey '278 further reducing the pressure in the central hole (paragraph [0093]) and increasing the temperature to which the preform is exposed to a temperature sufficient to soften glass (paragraphs [0093] and [0099]). Additionally, Berkey '278 teaches:

a. a furnace that comprises multiple zones that are controlled to various temperatures for various processing steps including drying, consolidating,

reducing pressure in the central hole, increasing the temperature, and reducing the diameter of the central hole (paragraphs [0085], [0101]-[0109]; Figs.7-9)

b. removing the consolidated core preform from the furnace ("the first step may occur in one location, e.g. at the consolidation furnace, and further hole closure and/or full collapse may occur in a second location, e.g. in a holding oven or a redraw furnace", paragraph [0121])

for the benefit of manipulating the temperature of the preform as needed for various processing steps. ("A plurality of hot zones may be desirable, or necessary, in order to raise or maintain the temperature of the portion, or portions, of interest in the preform. The skilled artisan will recognize that factors such as the traverse rate of the preform, the dimensions and composition of the preform, the heat energy available from the hot zone, including the heat exchange with the surrounding environment within the furnace, may all contribute to the determination of either the desirability or the necessity of having more than one hot zone", paragraph [0108]). While Berkey '278 does not describe the exact movement of the preform between furnace zones as claimed, it is considered that it would have been obvious to one of ordinary skill in the art at the time of the invention to determine how to move the preform between furnace zones for the benefit of manipulating the temperature of the preform as needed for various processing steps.

10. Regarding claims 21, 22, 23, and 24, Berkey '278 further teaches the pressure is reduced to at most 200 mBar, and at most 100 mBar ("the first pressure is less than about 10 Torr", page 12, claim 7 – wherein 10 Torr = 13 mBar).

11. Regarding claim 25, Berkey '278 further teaches reducing the diameter of the central hole comprises subjecting the glass core preform to a temperature of about 1495°C to about 1540°C ("a consolidated preform is disposed within a furnace such that the entire preform, is exposed to a preferably isothermal heat zone which raises the temperature of the preform to...between 1420°C and 1550°C…until the inside diameter of the perform defining the centerline aperture is reduced but not fully collapsed upon itself", paragraph [0132]; "the consolidated preform…was raised to a temperature of 1500-1550°C" paragraph [0137] – wherein the value of 1500°C constitutes a specific embodiment within the claimed range).

In the alternative, the ranges taught by Berkey '278 overlap the claimed ranges, and it is considered that it would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the temperature for the benefit of creating the desired amount of softening of the preform for a particular soot/glass composition ("the skilled artisan could readily determine the temperature(s) applicable to a soot preform of a particular composition", paragraph [0086]).

12. Regarding claim 26, Berkey '278 further teaches reducing the diameter of the central hole comprises subjecting the glass core preform to a temperature sufficient to soften glass for 1 hour to 3 hours ("the temperature of that part of the perform is sufficiently high wherein that part of the preform is soft enough to enable the centerline aperture 60 in that region to contract", paragraph [0099]; "a consolidated preform is…exposed to a preferably isothermal heat zone which raises the temperature of the preform…for a period of between 2 hours and 10 hours", paragraph [0132];

“consolidated preform...was raised to a temperature...for about 2 hours", paragraph [0137]).

13. Regarding claim 27, Berkey ‘278 teaches a ratio between the core radius and the external radius of a consolidated preform of 0.14, which is lower than 0.4 as claimed ("The soot preform was consolidated and the inside diameter shrunk to about 7 mm while the outside diameter was greater than 50 mm", paragraph [0133] - wherein 3.5 / 25 = 0.14). While Berkey '278 is silent regarding the specific ratio of the core radius and external radius of the soot core preform (pre-consolidation), Berkey ‘278 does teach that as the core radius contracts, the external radius contracts as well (“…causing the inner surface (and inside diameter) of the preform to contract…The outer surface (and outside diameter) of the preform contracts as well”, paragraph [0106]). It is considered, then, that it would have been obvious to one of ordinary skill in the art at the time of the invention that the ratio between the core radius and the external radius of the soot core preform would be close to that of the consolidated preform, which would be lower than 0.4, as claimed.

Additionally, Berkey ‘278 teaches that the ratio between the core radius and the external radius is a result effective variable because it may be altered in order to optimize vacuum forces needed and behavior of the preform during closure of the central hole, thereby reducing geometric perturbations in and improving performance of the final optical product (“If the ratio of the outside diameter of the preform is sufficiently large, forces can be generated, by reducing the outside diameter of the preform, which are sufficient to close the centerline aperture. Thus, if the outside diameter of the

preform is sufficiently large, a hole within the preform can be closed during a diameter reduction operation, without having to utilize significant vacuum forces. In this way, circular and/or symmetric hole closure can be enhanced", paragraph [0128]). Please see In re Boesch, 617 F.2d 272, 205 USPQ (CCPA 1980). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Berkey '278 by optimizing the ratio between the core radius and the external radius for the benefit of optimizing vacuum forces needed and behavior of the preform during closure of the central hole, thereby reducing geometric perturbations in and improving performance of the final optical product.

14. Regarding claim 28, Berkey '278 further teaches:

a. fitting a low-melting temperature member ("Glass plug 66 is preferably made from a relatively low melting point glass", paragraph [0082]) to a lower end of the central hole before the step of drying ("Centerline aperture 60 located near distal end 61 of soot core blank 58 is preferably fitted with a glass bottom plug 66 prior to positioning porous body 58 within consolidation furnace 64A", paragraph [0082]; "soot preform 58 is preferably chemically dried…within consolidation furnace 64", paragraph [0084])

b. reducing the pressure in the central hole comprises extracting gas from the central hole from an upper end thereof ("As seen if Fig. 6,…Negative pressure may be applied to interior cavity 71 of inner handle 76 and interior cavity 69 of integral handle 52", paragraph [0090]; "the centerline aperture 60 is

evacuated to reduce the pressure therein...to only partially close or contract the centerline aperture 60", paragraph [0093]; see also paragraph [0107]).

Response to Arguments

15. The rejections under 35 USC § 112 of the previous Office action dated 08-17-2009 are withdrawn.

16. Applicant's arguments filed 12-16-2009 have been fully considered but they are not persuasive. Arguments are summarized as follows:

a. Berkey '278 has no concern or appreciation of the significance of the hole diameter value at the end of the drying and consolidating step.

b. Berkey '278 fails to teach or suggest too narrow a hole is associated with fiber attenuation due to internal defects or that too wide a hole is associated with fiber attenuation due to the water and/or OH^- content in the central hole. Thus, Berkey '278 does not teach central hole diameter as a result effective variable. Because Berkey '278 does not recognize or appreciate that there is a trade-off between internal defects in the fiber core and water contamination, optimization of central hole diameter is not possible.

Response:

a. Berkey '278 clearly expresses concern and appreciation of the significance of the hole diameter at the end of the drying and consolidating step, as described for the rejections above and previously (e.g., Berkey paragraphs [0014]-[0116] and [0119]). The specific value of the diameter, then, is obvious to

optimize as a result effective variable, as also described in the rejections above and previously.

b. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., fiber attenuation, internal defects, water and/or OH^- content in the central hole) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Further, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Berkey '278 clearly suggests optimization of central hole diameter for the benefits described in the rejections above and previously.

17. Applicant's remaining arguments have been considered but are moot in view of the new ground(s) of rejection, as necessitated by applicant's amendment.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin Snelting whose telephone number is (571) 272-7169. The examiner can normally be reached on Monday to Friday 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven P. Griffin/
Supervisory Patent Examiner, Art Unit 1791

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